UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,719	06/26/2003	Anupam Sanyal	55061-41077	5796

21888 7590 03/26/2008

THOMPSON COBURN, LLP
ONE US BANK PLAZA
SUITE 3500
ST LOUIS, MO 63101

EXAMINER	
TOOMER, CEPHIA D	

ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
03/26/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDOCKET@THOMPSONCOBURN.COM

Office Action Summary	Application No.	Applicant(s)	
	10/606,719	SANYAL, ANUPAM	
	Examiner	Art Unit	
	Cephia D. Toomer	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 16-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 16-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the remarks filed December 14, 2007.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-6, 9-10 and 16-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Johnson (US 6,729,248).

Johnson teaches additives for coal-fired furnaces wherein the additives include an iron compound such as ferrous and/or ferric oxides (see abstract and col. 3, lines 59-66). The coal is Powder River Basin coal (PRB) (high calcium content) (see col.2, lines 1-3, 46-49). Johnson teaches that the iron is present in amount of at least 0.5 wt % (see col. 10-15). Johnson teaches that the additive can be contacted with the coal feed in a number of different ways, for example mixed with the coal feed at the shipping terminal, added to the coal reclaim belt or added to the coal bunkers (see col. 7, lines 15-21). Johnson teaches that his method provides for an effective system for enhancing combustion in cyclone furnaces. Johnson inherently teaches the claimed method because he teaches the same steps as those set forth in the present claims.

Accordingly, Johnson teaching all the limitations of the claims anticipates the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,729,248).

Johnson has been discussed above. However, Johnson fails to teach that the coal and additive are ground. However, it would have been obvious to one of ordinary skill in the art to perform this step because it would ensure adequate mixing of the coal and additive.

Johnson fails to teach in the provisional application the proportions of claim 8. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the proportions of the iron compound through routine experimentation for best results. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the *prima facie* case of obviousness. See *In re Boesch,* 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), and *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

4. Claims 1-10, 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buecker.

Buecker teaches using low-sulfur coal from Powder River Basin (PRB) as the primary fuel source for power plants. The coal is high in calcium. See page 1, first and fifth paragraphs. Buecker teaches that the coal handling facility contains a crusher granulator and this disclosure suggests that the coal is ground before use. See page 1, fourth paragraph). Buecker also teaches that the coal is combined with iron oxide (the skilled artisan would envisage ferric oxide) before it is burned and that the chemical enhances the characteristics of the slag (see page 2, last two paragraphs). Buecker teaches the limitations of the claims other than the differences that are discussed below.

In the first aspect, Buecker differs from the claims in that he does not specifically teach the claimed methods. However, no unobviousness is seen in this difference because Buecker teaches a coal composition that is similar to that of the present invention and he uses the coal composition in the same environment as Applicant. Therefore, it would be reasonable to expect that the coal composition of Buecker would increase efficiency of heat transfer of a furnace, absent evidence to the contrary.

In the second aspect, Buecker differs from the claims in that he does not specifically teach that the furnace exit gas temperature is reduced. However, it would be reasonable to expect that the temperature would be reduced since Buecker teaches a coal composition that is similar to that of the present invention and he uses the coal composition in the same environment as Applicant.

5. Claims 1-10 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Radway (US 5,819,672).

Radway teaches treating coal with a darkening agent wherein the darkening agent is iron oxide (the skilled artisan readily envisages ferric oxide)(see abstract; col. 3, lines 15-32; example 1). Radway uses PRB coals which are known for their high calcium content (see col. 2, lines 42-49; example 1). Since Radway teaches that the darkening agent may be a solid it is implied that the coal/agent may be ground, especially in view of Radway teaching that the agent may be applied in any appropriate fashion (see col. 3, lines 60-64). Radway teaches the limitations of the claims other than the differences that are discussed below.

In the first aspect, Radway differs from the claims in that he does not specifically teach the claimed methods. However, no unobviousness is seen in this difference because Radway teaches a coal composition that is similar to that of the present invention and he uses the coal composition in the same environment as Applicant. Therefore, it would be reasonable to expect that the coal composition of Radway would increase efficiency of heat transfer of a furnace.

In the second aspect, Radway differs from the claims in that he does not specifically teach that the furnace exit gas temperature is reduced. However, it would be reasonable to expect that the temperature would be reduced since Radway teaches a coal composition that is similar to that of the present invention and he uses the coal composition in the same environment as Applicant.

6. Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues that several elements of the claims of the Johnson patent are not supported by the provisional application and therefore the provisional application cannot be a basis of the priority for the Johnson patent.

In the rejection of the claims over Johnson, the examiner did not cite any of the claims as teachings against the instant claims. Therefore, the Johnson patent is a valid reference because all teachings cited against the claims are found in the provisional application.

Applicant argues that Buecker teaches a fluxing agent.

The examiner has thoroughly reviewed Buecker and finds no teaching of a fluxing agent. Buecker teaches that the iron compounds and stabilizing chemicals are added to the coal. There is no mention that these stabilizing chemicals include fluxing agents.

Applicant argues that Johnson and Buecker teach boilers different from those of the present invention.

The examiner respectfully disagrees. Furthermore, Applicant has not set forth the type of boiler that is used in the claimed method. Applicant's method is limited to increasing efficiency of heat transfer of a furnace in which calcium-containing coal is burned.

Johnson and Buecker clearly meet this objective because they combine iron compounds with the calcium-containing coal.

Applicant argues that Radway teaches the standard prior art technique over which the present invention provides an improvement. Applicant argues that Radway

exemplifies the combination of the darkening and fluxing agent. Applicant argues the examiner's position in the prior office action is more of an argument that is applied when claims are rejected as anticipated by the prior art.

The examiner maintains the rejection and the arguments set forth in the prior office action. Radway clearly sets forth that the use of the fluxing agent is optional and he adds the iron oxide to the coal prior to combustion. Since Radway follows the same steps as those set forth in the present claims, i.e., adding the iron oxide to the coal and burning the coal, it would be more than reasonable to expect that the efficiency of the heat transfer is increased.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cephia D. Toomer whose telephone number is 571-272-1126. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cephia D. Toomer/
Primary Examiner
Art Unit 1797

10606719\20080317